ATOMIC ENERGY newsletter

THE FIRST AND ONLY [illegible] SERVICE

ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS, INC., 509 FIFTH AVENUE, NEW YORK 17, N. Y.

Dear Sir:

February 12th, 1952
Vol. 6...No. 13

The United States and Canada have recently exchanged information on atomic subjects, Gordon Dean, USAEC Chairman said in Washington last fortnight. It is the first time such an exchange has taken place with a foreign country under the amendment to the Atomic Energy Act adopted at the last session of Congress. Dean said the subject matter, of a highly secret nature, was approved for the exchange by the National Security Council, at a special meeting, and by the Department of Defense. (The amendment requires two principal conditions for such an exchange: (1) That the foreign country be able to guarantee security of the information imparted to it, and (2) that the exchange be substantially beneficial to the United States.

India will erect her first nuclear reactor within two years, it has now been disclosed. French experts are to assist with construction of the reactor, and two other foreign governments are expected to co-operate. The reactor is to be situated in southern India, near the Travancore coast, where lie the large deposits of monazite sands--a rich source of uranium and thorium.

The antibiotic terramycin has proved effective in reducing the mortality of rats exposed to whole body X-radiation, according to Drs. Gordon E. Gustafson, and Simon Kotelsky, of the Institute of Pathology, Western Reserve University, Cleveland. The experimenters found that the 30 day mortality of the animals treated with terramycin was 48% compared to 72% for those in the control group. The mean survival time of the rats in the control group was 10.6 days, compared to 15 days for the treated animals. The antibiotic was administered for a period of only 48 hours prior to the application of 660 roentgens of whole body X-radiation. The experimenters feel that terramycin may be even more effective when used for 72 rather than 48 hours before the radiation occurs.

The balance sheet of the U. S. Atomic Energy Commission now shows that since the U. S. first engaged in atomic work in June, 1940, to June 30, 1951, a net sum of $2,805,411,139 has been spent. Total appropriations were listed as $6,376,108,752 during the entire period, of which $1,434,602,201 was unexpended last June 30th. In such an accounting, the Commission considers the existing plants as a productive asset in arriving at its net cost figure. This, then, makes the total cost of the atomic program, as of June 30, 1951, the total appropriated minus unexpended funds. The gross cost to the U. S. taxpayer would therefore be $4,938,092.939. (For a resume of the USAEC's major activities in the last half of 1951, see pages 2 and 3, this LETTER.)

Three additional courses in the techniques of using radioisotopes in research will be offered by the Special Training Division of the Oak Ridge Institute of Nuclear Studies this Summer. Dates for the course are: June 9-July 4; July 7-Aug. 1st; August 11-September 5. The courses are designed to acquaint mature research workers with the safe and efficient use of radioisotopes in research. Each course is open to 32 participants.

Subscription rates: United States, U.S. possessions, and Canada, $18.00 a year. Latin America, $20.00 a year. All other countries, $25.00 a year.

ATOMIC ENERGY DEVELOPMENT, July-December 1951. A special digest prepared for this NEWSLETTER.

RAW MATERIALS - Deliveries of uranium concentrates to the USAEC from the Belgian Congo and Canada, during the past 6-months, continued according to schedule. Domestic production increased as a result of the expanded exploratory drilling program, higher prices for uranium ores, the bonus for initial production from domestic mines (p.5, this LETTER), the opening of new producing areas, and increased processing capacity. Planned rates of drilling in the expanded exploration program have been reached, and drilling now is at the highest rate since the program began in 1947. In South Africa, construction of plants to recover uranium from gold ore residues is proceeding on schedule. Under USAEC sponsorship, the U.S. Bureau of Mines, and the Geological Survey, are continuing the search for U. S. reserves of monazite, the principal source of thorium and rare earths. (The western U. S. monazite deposits contain somewhat less thorium than those of India and Brazil, which have supplied most of the world's monazite).

PRODUCTION - The output of fissionable materials (U-235 and plutonium) continued to increase during the last 6-months. Unit costs decreased, as a result of improvement in production processes and the expanded volume of operations.

NEW FACILITIES-Fernald, Ohio: A substantial portion of the design is complete and construction is well under way on the new feed materials production center here; George A. Fuller Co. is prime contractor.

Oak Ridge, Tenn.: The K-31 gaseous diffusion plant was completed and is operating.

Savannah River Operations: At this hydrogen bomb materials plant in South Carolina, employment of construction workers increased from 6,600 at the end of June to about 22,000 on December 31, 1951. Preliminary total cost estimates for this project, prepared with the design still far from completion, indicate that more than $1½ billion will be required to pay for design and construction. Du Pont is the prime contractor here.

Paducah, Ky.: Design and construction of the gaseous diffusion plant here, including auxiliary facilities and feed plant, continued at a fast pace. Estimated to cost $473 million, the prime contractor is F. H. McGraw & Co. Construction employment averaged 5,200 during June, 1951, and exceeded 13,000 before the year ended.

CONSTRUCTION & SUPPLY - As a gauge of the size of the total U.S. construction program in atomic energy it may be noted that in July, 1951, construction costs incurred by the USAEC were $54½ million, and that they rose to a level of about $80 million in November, 1951. (About 3% of total U. S. construction during the 5-months ending November 30, 1951 was for the U. S. atomic energy program.)

MILITARY APPLICATIONS - Atomic weapons were produced at the rate authorized by the President, and within the limits of the output of fissionable material. Advances were made in weapons research and development. Construction continued at several locations to meet the needs of the expanding weapons program. After site selection and some delay in acquisition of land, construction of a plant near Denver, Colorado was begun by the Austin Co., as general contractor; construction proceeded on schedule during the last half of 1951. Construction of additional facilities and rehabilitation of existing structures was well under way at the Pantex Ordnance Plant at Amarillo, Texas, with the construction work being done on both a cost-plus-fixed-fee and competitive bid basis, with the latter method used wherever practicable. Silas Mason Co. is doing the cost-plus portion, and lump sum contracts have been awarded to several different contractors. Other developments were the series of nuclear detonations at the Nevada test site in October and November of 1951. Objectives of these detonations were to provide data for weapons development work, as well as to study various physical effects: blast, radiation, heat, etc. The Armed Forces used the tests for the military implications involved. Additionally the weapons program comprises research and development, and the manufacture, testing, storage, custody and surveillance of atomic weapons.

ATOMIC ENERGY DEVELOPMENT, July-December 1951. (Continued)

NUCLEAR REACTOR DEVELOPMENT- Experimental Breeder Reactor: In the last six months, this reactor was completed by the Bechtel Corp., at the National Reactor Testing Station, Idaho, and it was brought to the operating point by Argonne National Laboratory, the operator. It is the first reactor of appreciable size to operate with fast neutrons.

Materials Testing Reactor: Construction of this reactor, at the testing station in Idaho, by the Fluor Corp., continued. Engineers of Phillips Petroleum Co., operating contractor, after training at Oak Ridge with a pilot model of the MTR, took up their assignments at the testing station. The MTR is expected to produce a neutron flux more intense than any now available.

The Naval Reactors: Construction at the testing station of buildings and facilities for a land-based prototype of the Submarine Thermal Reactor power plant was advanced. Installation of machinery is to be by the Electric Boat Co., Groton, Conn. Both the construction contractors and Electric Boat are sub-contractors to the Westinghouse Electric Corp. which will operate the nuclear power plant in consultation with the Argonne National Laboratory. Contractual arrangements are being made for the submarine thermal reactor which is to go into the first nuclear-powered submarine. By agreement between the USAEC and Westinghouse, the latter will furnish the reactor for the submarine which the Navy has named the "Nautilus". The Navy's Bureau of Ships has contracted with Electric Boat to construct the hull of the Nautilus, and with Westinghouse for the propulsion machinery. Work continued by the Knolls Atomic Power Laboratory on design and development for the Submarine Intermediate Reactor. The first installation is to be a land based prototype of a nuclear power plant suitable for a submarine. Though similar in power specifications to the Submarine Thermal Reactor, this reactor will operate in the intermediate neutron energy range, and is being designed along substantially different lines.

Chemical processing plant: Construction of this plant, at the testing station, drew nearer to completion; it will be used for the separation of unused nuclear fuel from used fuel units. Foster-Wheeler Corp., New York, are architect-engineers on this project; the construction contractor is the Bechtel Corp., of San Francisco.

Aircraft Nuclear Propulsion: Acting under a letter contract of June 30, 1951, the Aircraft Gas Turbine Dep't. of the General Electric Co. began design and development leading toward aircraft propulsion by nuclear power. Facilities at Oak Ridge, formerly occupied by Fairchild Engine and Airplane Corp. (operating the earlier nuclear energy for propulsion of aircraft project) were taken over by G-E, and modification of buildings at Lockland, Ohio, began. Plans call for G-E to move the Oak Ridge staff to Lockland by June, 1952. This nuclear development is paralleling development of associated propulsion devices by G-E, and preparation of the air frame by Consolidated Vultee Aircraft Corp., Fort Worth, Tex., both under Air Force sponsorship. The Air Force also entered into contract with the Pratt & Whitney Division of United Aircraft Corp., E. Hartford, Conn., for work on an atomic aircraft engine.

INDUSTRIAL PARTICIPATION- The privately financed studies of reactor technology by four industrial groups progressed; they involve 8 firms, of which 5 are electric utilities. Main objectives are to determine feasibility of privately-operated dual-purpose reactors to produce fissionable materials and power; to examine the economic and technical aspects of building such reactors in the next few years; and to determine the possible research and development needed.

PHYSICAL RESEARCH- About $37 million was allocated to the support of basic and applied research for fiscal year 1952, with 75% devoted to research in USAEC laboratories, and the rest to contracts with universities and private research institutions.

BIOLOGY & MEDICINE- A major objective in this program continued to be to investigate and develop methods of protection from radiation. To understand better the hazards of atomic warfare, studies continued of the effect of radiation on life processes.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear work...

New portable survey meter, the Raychronix Model D-3 (commonly referred to as the "Samson"); for measuring low level alpha or beta contamination on flat or irregular surfaces. Housed in a light aluminum case, the meter is calibrated 0-500; 0-2500; and 0-12500 alpha particle counts per minute. Corresponding gamma radiation ranges are 0-0.7, 0-3.5 and 0-17.5 mr/hr. An ionization chamber in the bottom of the instrument is used for table-top monitoring; a connector provides for an external probe containing chamber and pre-amplifier for checking irregular surfaces. Additional features of the instrument include a 3-tube, 100% feedback circuit to degenerate leakage, input capacity and noise; a plug-in battery pack containing a 300-hour mercury cell filament supply and 1000-hour B supply; mechanical and circuit improvements that reduce 8-hour drift to less than 10% full scale. Weight of the meter is 5-pounds.--Radioactive Products, Inc., Detroit 26, Mich.

Analysis unit mount; model L-76. Supports ten of this manufacturer's L-75-A analysis units, in a "lazy Susan" manner. For measurement of the contamination of water and other low level determinations on dry or liquid samples. Permits any unit to be loaded, charged and read without disturbing the others. Consists of circular metal disc which supports the analysis unit near its rim and which can be rotated around a centrally mounted light source. The disc is supported by rollers which are secured to a metal base plate.--Landsverk Electrometer Co., Burbank, Calif.

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear field...

The Role of Engineering in Nuclear Energy Development. Proceedings of the symposium at Oak Ridge, in the Summer of 1951, on that subject. 509 pages. Published by the USAEC's technical information service as TID-5031.--Office of Technical Services, Department of Commerce, Washington 25, D.C. ($1.40)

The Theory of Isotope Separation, by Karl Cohen. Gives the first connected account of cascade separation theories, applicable to diffusion, distillation, centrifugation, thermal diffusion, exchange reactions, electrolysis. Vol. 1 in the Special Separations Project of the National Nuclear Energy Series. 360 pages.--McGraw-Hill Book Co., New York, N. Y. ($2.00)

Preparation, Properties and Technology of Fluorine and Organic Fluoro Compounds. Edited by C. Slesser and S. R. Schram. Vol. 1 in the Materials Procurement Project of the National Nuclear Energy Series. 868 pages.--McGraw-Hill Book Co., New York, N. Y. ($2.00)

Radiation and Monitoring Fundamentals for the Fire Service. Practical information on the effect and damage range of blast, heat, radiation, and the general aspects of an atomic explosion. Provides, in a simplified manner for the non-technical reader, a section on nuclear physics. A section on fire department monitoring lists immediate needs in equipment and manning, and outlines procedures, step by step. Several decontamination techniques are given, as well as personal protective measures for firemen. The present book follows a previous publication of this organization: Radiation Hazards of Radioactive Isotopes in Fire Emergencies (1950). 42 pages. --International Association of Fire Chiefs, 22 E. 38th St., New York 16, N. Y. (75¢)

The Warden's Handbook, H-7-1. A volume designed as a reference aid for Federal Civil Defense block wardens. Includes suggestions for recruiting, training and equipping members of the block warden unit, and for performing attack duties. Includes recommendations for informing and training residents of the block in self-defense. 34 pages.--Superintendent of Documents, Washington 25, D.C. (15¢)

NOTES: Arrangements have been made by the British Ministry of Supply and the Stationery Office for suitable unclassified reports from the British Atomic Energy Research Establishment to be available for sale to the public. This is an extension of the present arrangement whereby declassified reports are made available. The titles of reports available will be listed by the Stationery Office in the Daily List of Government Publications, and in addition, quarterly lists will be issued by the Ministry of Supply. Inquiries should be made to H. M. Stationery Office, Cornwall House, Stamford St., London, S. E. 1, England.

RAW MATERIALS...radioactive minerals for nuclear work...

UNITED STATES- A contract has now been signed by the USAEC with the Anaconda Copper Mining Co. under which the USAEC will purchase the uranium production of an ore processing plant which Anaconda will build near Grants, Valencia County, New Mexico. The plant is expected to be ready for operation early in 1953. During the past year, Anaconda and the Santa Fe Railroad have been carrying on large scale exploration and development programs in the Grants area. These programs, together with prospecting, exploration, and development by other private interests, have indicated sufficient quantities of limestone-gangue uranium-bearing ores to warrant the construction of a processing plant. (Uranium ore in the Grants area was first discovered by an Indian, Paddy Martinez, in the Summer of 1950.) Under the terms of the contract, Anaconda will build and operate the processing plant and auxiliary facilities, all of which will be company-owned. The USAEC has agreed to purchase the uranium oxide production of the plant for a five year period. Anaconda will start construction work immediately, and the plant is expected to be placed in operation about April, 1953. Arrangements are being made to provide a market at the plant site for uranium-bearing ores produced by other operators in the area.

The USAEC has now established a purchasing station for uranium-bearing ores on the Navajo Indian Reservation at Shiprock, New Mexico. The depot was established primarily to receive uranium-vanadium bearing ores from northeastern Arizona. Most of the ore in this region comes from the Navajo Indian Reservation. Many of the Navajos are engaged in prospecting and mining operations. The Shiprock depot will be operated for the USAEC by the American Smelting and Refining Co., which also operates ore purchasing stations at Monticello, and Marysvale, Utah. (Limestone-gangue uranium-bearing ores, all of which contain in excess of 16% calcium carbonate, are not amenable to the process contemplated for processing Reservations ores, and will not be accepted at Shiprock. Such ores are to be sent to the Grants processing station.)

More than a quarter of a million dollars was paid out last year to uranium ore producers under the new incentive bonus program of the USAEC. The graduated bonus arrangement, based on uranium oxide content of the ore, was established in June in Domestic Uranium Program Circular 6, and was retroactive to March 1, 1951. Approximately one-third of the 70 mines which have been certified for bonus payments had no production prior to March 1st, 1951.

MEXICO- Recently decreed regulations governing uranium and other similar minerals have now been published in the Official Gazette here. Under the new regulations, only Mexican nationals or Mexican-owned companies may receive concessions to exploit uranium deposits. No guarantee is given, under these regulations, that a discoverer of uranium deposits will receive the concession to mine them. The Federal Minerals Development Board is vested with complete authority, and the regulations state that the board may grant concessions to persons best qualified to extract the ore. It is further stipulated that any kind of uranium, thorium, etc., must be reported to the Board within thirty days. If the owner of the surface land does not agree on terms with the Government, expropriation may be resorted to.

BRAZIL- A new beryllium oxide plant is to be brought into operation at Resende, Rio de Janeiro, in March. The plant, which will cost $275,000 , is being constructed by Proberil, S.A., a new firm jointly financed by Brazilian and American interests, and will have a capacity of 90 tons of beryllium oxide a year. Raw materials for the new plant will come from the largest known beryllium mine in Brazil, located in the state of Minas Gerais. Brazil is a principal producer of beryllium, of great utility for nuclear reactor work. Brazilian beryllium ore runs about 11 to 14% metal, while the world market standard for the ore is about 10%. Other beryllium deposits are found in Brazil in the states of Bahia, Rio Grande do Norte, and Paraiba.

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER

February 12th, 1952.